

THURSDAY, JUNE 28, 1894.

STUDIES IN FORESTRY.

Studies in Forestry. A Short Course of Lectures on Silviculture, delivered at the Botanic Garden, Oxford, 1893, by John Nisbet, D.Oec. (Oxford: Clarendon Press, 1894.)

DR. NISBET is an officer of the Indian forest department, specially trained in forestry in Germany, and after spending a number of years in the charge of extensive forests in Burma, he was, a year or two ago, permitted by the Secretary of State for India to make a further study of German forestry in Bavaria. Whilst in Bavaria he wrote six useful essays on forest subjects, which have been published by order of the Secretary of State for India, and they are now being circulated to subscribers to the *Indian Forester*, a monthly magazine published in Dehra Dun, where Dr. Nisbet is now serving as deputy director of the Indian Forest School.

The author states in his preface that he has, with the consent of the Secretary of State, embodied much of the matter in these essays in the "Studies in Forestry," and much of the remainder occurs in Dr. Nisbet's "British Woodlands," or in his translation of a German work on forest protection.

Much of the matter contained in the "Studies" will also be found in Dr. Schlich's "Manual of Forestry," vols. i. and ii., which works are largely founded on the same authorities as those used by Dr. Nisbet, whose work must have been greatly simplified by having ready to hand Dr. Schlich's well-chosen English equivalents of the various German technical forest terms.

As all the books just referred to have been already reviewed in NATURE, a detailed notice of the present work is hardly called for, though it will prove instructive to those who have not seen the former books, if they allow for the author's want of practical experience in the British Isles, where forestry is under different climatic conditions to those prevailing in Germany. The first chapter of the book, however, on "Forestry in Britain," is very forcibly and well written, and contains much suggestive matter to which the attention of everyone interested in forestry should be drawn.

Taking the area of British forests roundly at 3,000,000 acres, and allowing ninety years as their average rotation, their cost of production is estimated as equivalent to:—

(Annual rental of 3,000,000 acres + cost of forming, or regenerating them) $\times 1.0r \frac{90}{2}$;

where r is the rate of interest at which a forest owner is content to lock up his capital of soil and growing stock.

This rate he, perhaps erroneously, urges should be higher than that used in agriculture, on account of the greater risk incurred by forests from storms, insects, fire, &c. Scotch owners who have suffered from the hurricane last December, which blew down $1\frac{1}{2}$ million trees in Perthshire and Forfarshire, will be disposed to agree with the author here; but the fact is that all these risks would be very greatly reduced if British forests were properly managed so as to withstand storms and the

other dangers referred to. However, owing to the appreciation of *broad acres*, Dr. Nisbet puts the rate of interest at $2\frac{1}{2}$ per cent., that of funded property, which is probably the correct figure after all. Placing therefore the average rental of woodland at 5s. an acre, and the cost of formation at £2, that of planting Scotch pine in Perthshire; he arrives at the following figures:— $(3,000,000 \times £2 - 5s.) 1.025 = £20,500,000$ nearly, which is the cost of production of our woodlands, the prospective value of the mature crop being much greater. On comparison with results in Germany, and assuming that our forests are as well managed as German forests, which is at present far from being the case, they should yield an annual revenue of £2,000,000, or at 25 years' purchase be worth £50,000,000. Forty years' purchase and £80,000,000 would, however, be the correct figure at $2\frac{1}{2}$ per cent.

After this estimate comes a reference to the value of our timber imports from Northern Europe, which in 1892 was £9,207,905, and the fact, to which Dr. Schlich in 1890 first drew public attention, that all this material might be produced on waste land in the British Isles, and employment thus provided for several hundred thousand people.

The rapidly approaching exhaustion of the North American forests is also referred to; and considering that the United States is now importing annually enormous quantities of timber from the Dominion of Canada, and that the Canadian forests are being worked in the same destructive manner as in the United States, it is surely time for Canadian legislators to attend to the formation of large State timber reserves, and provide for the education of a trained forest staff to look after them. *Quis custodiet ipsos custodes?* the negligence shown by the Canadian Executive in this respect looks as if the lumber trade was more attractive than attention to the future welfare of the country. A reference to the latest number of the *Garden and Forest* shows that the United States Government has done nothing yet to protect and manage the vast tracts of forest which there, at any rate, have been for the present saved from alienation as State property. One of the strongest reasons in favour of our establishing national instruction in forestry on a proper scale, and bringing our own Crown forests into a high state of production, is the example it would set to our colonists, and the chances that more of them might come here to study forestry, as they do at present to study engineering, law, and the arts.

Dr. Nisbet refers in hard but not undeserved terms to the results of the Parliamentary Committees on Forestry, remarking that the solemn farce of appointing a Committee, and then letting the question slide, has twice been played with regard to forestry in Britain. The only results from the Committee of 1887 have been that the Treasury pays £100 a year to a lecturer on forestry at Edinburgh University, and £250 (half the salary of the professor of agriculture and forestry) at Newcastle, also £150 each to the Royal Botanic Gardens, Edinburgh and the Glasgow Technical Institute for free classes to foresters and gardeners.

The second Committee of 1889, to inquire into the administration of the Crown forests, came to the conclusion that they were being carefully administered, which does

not tally with the previous finding of the 1887 Committee.—“*In respect of the Crown forests, the difference between skilful and unskilled management would itself more than repay the cost of a forest school.*”

Certainly it would be for the national benefit, if purely pleasure-grounds, such as Windsor Park, were excluded from the Crown forests, and handed over to the Board of Works, and that the 57,300 acres of the Crown forests actually under timber crops, and worth at least £1,500,000, should be brought up to the highest degree of productiveness, and serve as models of economic forestry to all the private forest-owners in Britain.

Dr. Nisbet states that the salaries and allowances of the officers in charge of the Crown forests average £900 a year, and urges that in all future appointments to these posts a high degree of qualification in forestry should be required, and also from one of the Commissioners of Woods and Forests.

A most amusing account, taken from the Report of the Forestry Committee of 1887, is given by Dr. Nisbet of the examination of a lecturer in forestry of the Cirencester Agricultural College, who stated that he taught forestry in six or seven lectures, but admitted that he had himself learned forestry there, though he did not consider the course sufficient *even for land-agents*. Other quotations from the evidence of Mr. Britton, a leading timber merchant of Wolverhampton, and the late Mr. MacGregor, then in charge of 20,000 acres of the Athole forests in Perthshire, testify to the utter ignorance of forestry possessed by land-agents and factors in both England and Scotland.

In the present state of agriculture, where economic forestry alone will pay on the poorer lands, it is essential that land-agents should possess a fair knowledge of forestry. Broillard, the French silviculturist, goes even further and advises land-owners to learn how to manage their forests for themselves.

Dr. Nisbet refers to the well-equipped forestry staff at Cooper's Hill College, where the three years' course costs £183 a year, including the cost of a fourteen days' tour in the Norman forests, and five months' practical forestry instruction in Germany. He states, however, that the Forestry Branch was added to Cooper's Hill, to prop up an Engineering College which had ceased to pay its expenses, and that there is nothing in the situation of the college to have induced the Government to have located the Forestry Branch there. As a matter of fact, Cooper's Hill is admirably situated from a forest point of view; the 9,000 acres of the Windsor Forest, exclusive of the park, and stocked with every species of tree which will grow in Central Europe, is close to the college, and in it the college has leased 800 acres, chiefly of Scotch pine forest, for practical work for the forest students. There are excellent forest nurseries, osier beds on the Thames, a good Crown coppice with standards of 800 acres at Esher, and large areas of beech selection forests on the Chiltern Hills, all of which are regularly visited by the students, whilst the magnificent oak and beech forests of Normandy are only a night's journey distant, and in them the students spend fourteen days every year. One reads nothing but praise of the old Indian College at Haileybury; and *esprit de corps* among the scientific branches of the Government of India is certainly fostered

by training engineers, telegraphists, and foresters at the same college in the loveliest and most wooded part of England. There are more distractions at Oxford, and longer vacations; and after allowing for the cost of all the necessary excursions and practical work in continental forests, it is doubtful whether living at Oxford would be cheaper than at Cooper's Hill, if it had been selected instead of the latter place for the training of future Indian forest officers.

There can, however, be no question that independently of the training of Indian forest officers, in which already men from the colonies have joined, and there is plenty of room for more, there should be available at our principal universities regular instruction in forestry for the benefit of land-agents and land-owners. Dr. Nisbet suggests that two chairs of forestry, each at £700, should be established by the State at Oxford, Edinburgh, and Dublin, and four instructorships in forestry, at £150 each, at Dunkeld, Grantown, Coleford, and Lyndhurst. This would cost in round numbers £5000 a year, which is a slight insurance to pay for the better management of woodlands which have already cost £20,000,000, and will most likely be considerably added to in the immediate future, being less than $\frac{1}{4}$ d. an acre on land actually under timber.

Forestry is, however, eminently a practical profession, and the best teaching will not suffice unless extensive well-managed tracts of our Crown forests are also made available for practical illustration of the matter taught by professors.

Sir J. Lubbock quite recently stated at a public meeting that good forestry could only be initiated by the State, and it must be satisfactory to all lovers of forestry that he is again disposed to take interest in the matter, although when member of the Committee on Forestry his attention was unfortunately distracted by other pressing business, and no satisfactory results followed.

W. R. FISHER.

THE COMPARATIVE PATHOLOGY OF INFLAMMATION.

Lectures on the Comparative Pathology of Inflammation, delivered at the Pasteur Institute in 1891 by Elias Metchnikoff, Chef de Service à l'Institut Pasteur. Translated from the French by F. A. Starling and E. H. Starling, M.D. With sixty-five figures in the text, and three coloured plates. (London: Kegan Paul, Trench, Trübner and Co., 1893.)

THE work before us is a translation of Prof. Metchnikoff's well-known book on the comparative pathology of inflammation. This work has been so well reviewed by Prof. Ray Lankester in NATURE (vol. xlv. p. 505), that it is almost superfluous to give a fresh account of it.

Readers of NATURE will remember that the book is really an attempt at establishing a biological theory of inflammation, which is summed up by the author as follows:—"Inflammation generally must be regarded as a phagocytic reaction on the part of the organism against irritants. This reaction is carried out by the mobile phagocytes, sometimes alone, sometimes with the aid of the vascular phagocytes or the nervous system." This